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ABSTRACT

This learning module on developing a delivery system is one of nine developed for use in training administrators, teachers, and prospective teachers in the utilization of Vocational-Technical Education Consortium of States (V-TECS) catalogs of performance objectives, criteria-referenced measures, and performance guides. Readings are provided on the following subject areas: selecting a method of instruction (group or self-paced) for performance-based vocational education (PBVE); selecting a management plan format (type of lesson plan); and selecting media, facilities, and equipment. Examples of module behavior objectives are these: be able to identify criteria for selecting a method of instruction for a given task; essential elements of a module to be used for self-paced instruction; the major differences in media, equipment, and facilities requirements for PBVE programs and non-PBVE programs; and the major differences in media, equipment, and facilities requirements for instruction via the group method and self-paced method. A glossary of terms, a glossary self check, and a self check on selecting a mode of instruction are provided. (The instructor's handbook--CE 017 440--for use with all the modules, contains the checkout activity, a multiple choice test keyed to the behavioral objectives stated at the beginning of the module. The modules are designed for use with individuals or with groups.) (JH)

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ED159386

Implementing Performance-Based Vocational Education Utilizing V-TECS Catalogs

DEVELOPING A DELIVERY SYSTEM

MODULE 4

State Department of Education
Office of Vocational Education
Columbia, South Carolina 29201

In cooperation with

Vocational Education Media Center
Clemson University
Clemson, South Carolina 29631

1978

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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CE 017 444

INTRODUCTION:

Thus far, most decisions concerning curriculum development have been predetermined. Tasks, performance objectives criterion-referenced measures and performance guides were predetermined, when available, by the V-TECS catalogs. Grouping was predetermined if duty was used as the rationale; sequencing, too, was predetermined if the catalogs were sequenced by a writing team prior to distribution, as some are. In the future supplemental objectives will be added before clustering or sequencing is accomplished.

It is at the point of selecting a delivery system or method of instruction that you, the teacher, will make the major decisions. One of the major decisions you will make concerns the degree to which you will individualize instruction, and to a large degree, this is dependent upon the method of instruction chosen. This module will discuss the major methods (modes) of instruction (group or self-paced) and suggest the types of materials, equipment, facilities and lesson plans needed for each of these methods.

DIRECTIONS:

Module 3 should be completed before beginning work on this module.

Read the OBJECTIVE section. If you think you can accomplish this objective now, turn to the CHECK-OUT ACTIVITY, page 20, and follow the instructions.

If you feel you are not able to accomplish this objective now, look at the LEARNING ACTIVITIES, page 1. Begin the learning activities and as soon as you feel you are ready, turn to the CHECK-OUT ACTIVITY, page 20, and follow the instructions.

OBJECTIVE:

Given instructional materials developed for this module, the participant will be able, with 100 percent accuracy, to identify on a multiple choice test:

1. criteria for selecting a method of instruction (group or self-paced) for a given task
2. essential elements of a module to be used for self-paced instruction
3. the major differences in media, equipment and facilities requirements for Performance-Based Vocational Education programs and non-Performance-Based Vocational Education programs.
4. the major differences in media, equipment and facilities requirements for instruction via the group method and those required by the self-paced method.
5. the difference between a module and a learning activity package.

LEARNING ACTIVITIES:

1. READ the Glossary of Terms for Module four.
2. CHECK YOUR KNOWLEDGE by completing Self-Check I – Glossary of Terms for Module four.
3. READ Section I, Selecting a Method (Mode) of Instruction for Performanced-Based Vocational Education.

   or_____
4. CHECK YOUR KNOWLEDGE by completing Self-Check II – Selecting a Method (mode) of Instruction.
5. READ Section II, Selecting a Management Plan Format.

   or_____
6. READ Section III, Selecting Media, Facilities and Equipment.

   or_____
7. Turn to the CHECK-OUT ACTIVITY, p. 20, and follow the instructions.

GLOSSARY OF TERMS – MODULE 4

In this module there are terms used with which you may not be familiar. Read through the glossary. Then, check your knowledge by answering the self-check on a separate sheet of paper. Compare your answers with those found at the end of this activity.

1. Delivery System – as used in this publication refers to a combination of methods used (group and self-paced) to implement performance-based education.

2. Educational Media – the means of communication that are available for educational purposes; do not usually include the live teacher, the student's peers, or other human resources, although the classroom teacher is the primary medium of instruction in most schools.*

3. Learning Activity Package – self-directional, self-instructional materials which contain provisions for the student to exempt or test-out on a specified objective or objectives. The student is usually directed to a variety of learning activities and to a variety of learning resources to obtain the information needed to accomplish the specified objectives. It does not usually contain, within its covers, instructional content, but instead refers the student to such content.

4. Module – self-directional, self-instructional materials which contain provisions for the student to exempt and test-out on a specified learning objective or objectives. It contains almost all or all information necessary for the student to accomplish the objectives specified, i.e., it is "content complete."

*Carter V. Good, ed., Dictionary of Education (New York: McGraw-Hill Book Company, 1973) p. 205.

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SELF-CHECK I

Directions: Match the following terms and definitions.

TERMS	DEFINITIONS
a. Module	1. – as used in this publication refers to a combination of methods used (group and self-paced) to implement performance-based education.
b. Learning Activity Package	
c. Delivery System	2. – the means of communication that are available for educational purposes; do not usually include the live teacher, the student's peers, or other human resources, although the classroom teacher is the primary medium of instruction in most schools.
d. Educational Media	3. – self-directional, self-instructional materials which contain provisions for the student to exempt and test-out on a specified learning objective or objectives. It contains almost all or all information necessary for the student to accomplish the objectives specified, i.e., it is "content complete."
	4. – self-directional, self-instructional materials which contain provisions for the student to exempt or test-out on a specified objective or objectives. The student is usually directed to a variety of learning activities and to a variety of learning resources to obtain the information needed to accomplish the specified objectives. It does not usually contain, within its covers, instructional content, but instead refers the student to such content.

SELF-CHECK I

Answer Key

1. c, 2. d, 3. a, 4. b

SECTION I

SELECTING A METHOD (MODE) OF INSTRUCTION FOR PERFORMANCE–BASED VOCATIONAL EDUCATION

Selecting a Method (Mode) of Instruction for Performance-Based Vocational Education

As mentioned in Module 1, Performance-Based Vocational Education is a concept which, simply put, requires that students be told in advance exactly what is expected of them and exactly how well they are expected to perform. Evaluation is made in accordance with some predetermined criterion or standard. A further requirement for Performance-Based Vocational Education is that instructional objectives be based on job-relevant (worker-validated) tasks. And as mentioned in Module 1, Performance-Based Vocational Education can be incorporated into the curriculum, regardless of the curriculum design or curriculum delivery system being used.

However, Module 1 suggested that because individualized instruction seems to facilitate Performance-Based Vocational Education and since it also enhances related concepts such as mastery teaching, and self-pacing, it would seem desirable to encourage a greater degree of individualization than now exists in our present programs. Three methods of delivery were suggested — the group approach, the self-paced approach and the combined approach. Although in reality the three levels are not distinct categories, it may be helpful to think about them as such when the delivery system is discussed in this module.

The Group Method

The group method is perhaps the most frequently used approach in many instructional programs. All students receive the same instruction and the same amount of instruction. Almost any method is appropriate for the group method – lectures, conferences, demonstrations, study assignments, as well as practical application in the laboratory (with all students going through the same sequence at the same time).

However, the critical concepts in performance-based instruction must be observed:

1. The content, or what is being taught, is based on worker-validated tasks which have been converted to performance objectives.

2. The criterion-referenced measures used to evaluate performance are based on predetermined standards or criteria.

The Self-paced Method

Here an instructor manages a number of students who progress through a predetermined series of events and activities at their own pace. Self-pacing does not necessarily mean that the student cannot meet with a group, if such a group setting can be arranged. In fact, self-pacing could conceivably be accomplished in almost any instructional setting as long as the students are allowed to move at their own pace. However, self-pacing is dependent upon freedom of time for mastery and self-directional, self-instructional materials (or freedom from teacher dependency).

Again, for instruction to be performance-based, the content must be based on performance objectives and the test must be criterion-referenced.

Combined Approach

The combined approach includes some self-pacing and some group pacing tailored to suit the nature of the instruction, student capabilities and the time and money available. At this time, the combined approach may be the most practical one for vocational education in most schools.

Classification of Tasks by Method

A chart similar to the one shown below may be helpful to the instructor in classifying performance objectives or tasks according to the more feasible method of instruction – group or self-paced.

CLASSIFICATION OF TASKS
BY TEACHING METHOD (MODE)

TASKS	GROUP				SELF-PACED			
	Group Lecture	Group Demonstration	Group Project	Other	Simulated	Live Activity	Other	
1. Record daily sales on unit control form.								
2. Record discounts allowable on invoices.								
3. Prepare bill of sales.								
4. Repair hydraulic assist transmission.								
5. Clean cooling system.								
6. Adjust or control temperature (air conditioning, vents and fans)								
7. Label plants for cuttings.								
8. Plant bulbs.								
9. Disk land.								
10. Pasteurize media (soil) with chemicals.								

Factors to Consider in Selecting a Method (Mode)

The following factors need to be considered when selecting a method (mode):

1. Availability of Educational Media (at this time most materials are not packaged as self-directional, self-instructional materials)

2. Availability of Instructional Materials, Supplies, and Equipment ("hands on" type performance testing may require more of all of these items – self-pacing perhaps more than group)

3. Flexibility of Instructional Facilities (the self-paced method may require more flexibility; however, this is debatable)

4. Ability Levels of Students (students of higher ability may perform better in a self-paced program)

5. Learning Styles of Individual Students (students who read well may perform better in a self-paced program - this is also debatable)

6. Flexibility in Scheduling Students (self-pacing requires freedom of time to master a given task)

7. Financial Constraints (for the short term, it would appear–due to initial investment in new media, equipment, etc. — the self-paced method (mode) would be more expensive than group)

8. Flexibility in Varying Program Objectives for Individual Students (ordinarily self-pacing would allow greater flexibility, but only if the student is allowed to select objectives) Group method could be used only for objectives common to all.

9. Reporting Student Progress(Grading) (ordinarily in a self-paced program students are graded according to modules successfully completed)

10. Administrative Support (some administrators may be reluctant to endorse self-pacing)

11. Ancillary Support– Pupil Personnel Services (how much help will be available from guidance counselors in identifying students who can function effectively in a self-paced program)

12. Instructor Adaptability & Flexibility (how strongly does the teacher see a need in his/her program to be self-paced and how will he/she change teaching methods)

13. Demands of the Job Market (does the job market have openings for students who have successfully completed only part of a program -- in self-pacing students can complete different objectives and a varying total number of objectives)

SELF-CHECK II – Selecting a Method (Mode) of Instruction

The tasks shown on the Task Classification Sheet were taken from V–TECS catalogs. Assume that these tasks are to be included in your instructional program next year. Using the classification sheet on this page, try to classify each of these tasks as to the method of instruction you would use. You may not be knowledgeable enough about these tasks to do all of them, but do what you can. Then compare your classification and reasons with those on page 8. Note that we are using tasks rather than objectives as a matter of convenience at this time.

Record your answers on a separate sheet.

CLASSIFICATION OF TASKS BY TEACHING METHOD (MODE)

TASKS	GROUP				SELF-PACED			
	Group Lecture	Group Demonstration	Group Project	Other	Simulated	Live Activity	Other	
1. Record daily sales on unit control form.								
2. Record discounts allowable on invoices.								
3. Prepare bill of sales.								
4. Repair hydraulic assist transmissions.								
5. Clean cooling system.								
6. Adjust or control temperature (air conditioning, vents and fans)								
7. Label plants for cuttings.								
8. Plant bulbs.								
9. Disk land.								
10. Pasteurize media (soil) with chemicals.								

CORRECT RESPONSES - Selecting A Method (Mode) of Instruction

CLASSIFICATION OF TASKS
BY TEACHING METHOD (MODE)

TASKS	GROUP						SELF-PACED					
	Group Lecture	Group Demonstration	Group Project	Other			Simulated	Live Activity	Other			
1. Record daily sales on unit control form.							✓					
2. Record discounts allowable on invoices.							✓					
3. Prepare bill of sales.							✓					
4. Repair hydraulic assist transmission.	✓											
5. Clean cooling system.	✓											
6. Adjust or control temperature (air conditioning, vents and fans)							✓	✓				
7. Label plants for cuttings.							✓	✓				
8. Plant bulbs.							✓	✓				
9. Disk land.	✓											
10. Pasteurize media (soil) with chemicals.	✓						✓					

REASONS:

1. This activity lends itself well to simulation using fictitious data. Self-directional, self-instructional materials could easily be provided in the form of modules or learning activity packages.
2. Same as above.
3. Same as above.
4. For courses offered at the secondary level, simulators or real transmissions may be difficult or expensive to provide. It may be best to provide only a group demonstration of this task.
5. To simulate or provide a real tractor with a dirty cooling system for students at all times may be very difficult. It may be best to demonstrate this task.
6. This task could be simulated, but in schools which have a greenhouse it may be possible to have each student assigned the task of controlling temperature during a selected week.
7. This task could be accomplished as an actual activity when growing a crop such as bedding plants. However, scheduling may cause problems. In order to perform the task at any time it may be necessary to provide simulation.
8. Same as above.

9. This task is usually done on a large scale and would probably require a group demonstration. It would be difficult to provide a tractor and disking implements for disking at any time the student is ready to perform.

10. This task is also usually done on a large scale and can be dangerous. At the secondary level, it may be best to do this as a group demonstration. It may, however, be possible to follow up the group demonstrations with simulation on a much smaller scale.

Management of the Group Approach

Using the group approach to implementing performance-based vocational education differs little from using the group approach in a non-performance-based vocational education program. However, as mentioned earlier, the instruction would be organized around job-relevant tasks, and performance would be judged on the basis of previously announced criterion-referenced measures.

These latter provisions may be difficult for the teacher to implement. The instructor can lecture or demonstrate to a large group of students with little or no problems, but how can she/he make provisions for practice and testing in a group setting? Granted, some tasks can be accomplished in a group setting, e.g., "paper/pencil" type tasks relevant to bookkeeping. But how could you have students grind valves in a group setting unless you had a valve grinder for each student? Perhaps the problem can be solved through group demonstrations or lectures on several tasks, followed by "hands on" practice and testing on several tasks. Other solutions may involve "peer teaching and testing."

Even so, the requirements specified by performance-based vocational education for "performance testing" in the sense of "hands-on" testing for each task will be a challenge to most teachers using the group method (mode). As a matter of fact, this requirement demands that, in the final analysis, practice and testing be individualized. So the option of delivery methods is more in the method of providing information – not practice or testing. Practice and testing require individualization. However, practice and testing as well as lecture and demonstration can, of course, be group-paced.

The requirement for accountability in vocational education makes it almost imperative that a record be kept for each student showing the tasks successfully completed. The teachers should make provisions for keeping such records. Examples of such records will be discussed in some detail in Module 6.

Management of the Self-Paced Method

Management of the Self-Paced Method will be discussed in Module 8 - Managing Self-Paced Instruction.

SECTION II

SELECTING A MANAGEMENT PLAN FORMAT

Introduction

After classifying performance objectives or tasks as to the mode of instruction to be used, the next step, ordinarily considered, would be to develop lesson plans for instruction. If the instruction is to be by group, a teacher-directed lesson plan is perhaps most appropriate. If, however, the instruction for a selected objective is to be self-paced, the self-directional, self-instructional format (module) is chosen.

Again, if the method (mode) of instruction is to be self-paced.then the student must be given self-directional, self-instructional materials.

As mentioned earlier, the lesson plan formats for Performance-Based Vocational Education and non-Performance-Based Vocational Education would not differ appreciably. However, in lessons planned for Performance-Based Vocational Education, the objective would be directly related to a performance objective which may be taken from a V-TECS catalog. Likewise, in Performance-Based Vocational Education, the evaluation section of the lesson plan would relate directly to a criterion-referenced measure or may, in fact, be a criterion-referenced measure taken from the V-TECS catalogs. The performance guide in the V-TECS catalogs may also be helpful in providing steps, ordinarily included in the lesson plan, in the teaching process.

Format for Self-Directional, Self-Instructional Material for Self-Pacing

Remember that if the student is expected to perform the task without (almost without) the aid of the instructor, self-directional, self-instructional materials must be available. These materials will usually take the form of a module or learning activity package. Modules differ from learning activities in that they (modules) are content complete; that is, they provide (within the modules themselves) all or nearly all information necessary to accomplish the objectives.

A typical module format follows:

1. Introduction
2. Directions - provisions for performance testing so that one may exempt the module if competent.
3. Objectives
4. Suggested learning activities - reading activities, listening or viewing audio-visuals, lectures, field trips, or almost any conceivable form of learning activity.
5. Instructional content in some form (usually illustrated print) is often included in the module. However, the learner can be directed to other publications or media to acquire the information needed. If students are referred to content, the unit is termed a learning activity package.
6. Self-checks - a means for the learner to check his/her own progress without the aid of an instructor.
7. Instructor's check sheet - a check sheet used by the instructor to assess student performance at various stages.
8. Check-out activity - usually the actual performance of the task — the criterion-referenced measure.

Format for Group-Paced Units or Lesson Plans

The format for a group-paced lesson plan would not differ materially from that of the self-paced unit or lesson plan format except that the plan is usually group oriented and is not necessarily self-directional and self-instructional. It is also teacher-oriented, i.e., it lists directions for the teacher - not the student. See the example by Pucel on page 13. Note that item "h" on the sample teacher-oriented lesson plan states the provisions to be made for student practice. Provisions must also be made for criterion-referenced measurement and the tasks performed must be based on job-relevant tasks if the instruction is to be performance-based.

The Sample Teacher-Oriented Lesson Plans shown on the following pages are typical of formats used with the group method. Remember!! These lesson plan formats do not guarantee performance-based vocational education unless job-relevant tasks are being taught and provisions are made for criterion-referenced measurement.

Another requirement of performance-based education which must be addressed is that of announcing to students, in advance of instruction, the criterion-referenced measure. See, again, the sample teacher-oriented lesson plan on page 13 and page 14.

A sample information sheet and assignment sheet to accompany the Teacher-Oriented Lesson Plan is shown on page 15. In this case, the information sheet provides procedures for accomplishing the tasks mentioned in the plan. These procedures vary but in most cases can be taken directly from the performance guides provided for each task in the V-TECS catalogs.

In our plan for vocational education in South Carolina, it is anticipated that information and assignment sheets will not have to be prepared by individual teachers for every objective taught. They may have to prepare some. However, it is our intent that the Vocational Education Media Center will prepare classroom delivery packages for the group mode as well as modules for the self-paced mode.

TEACHER-ORIENTED LESSON PLAN* [1]

Objective:

Criterion-Referenced Measure:

Tools & Materials:

Other Resources:

Instructor Actions (instructor directions)	Resource Materials
Examples: a. methods b. notes on class organization c. questions to highlight information and/or to evaluate student progress d. lecture outlines e. demonstration outlines f. notes regarding administration of criterion-referenced measures g. procedures for the use of peer tutors established. h. how and when provision will be made for student practice and criterion-referenced measurement (this activity is critical if you are planning performance-based instruction)	Examples: a. lecture notes b. demonstration outline c. audio visual materials d. teacher-made instruction sheets 1. assignment sheets 2. operation sheets 3. job sheets e. tests

*This type of plan is written the way you would write a diary after the lesson was done, except you actually write it before the lesson and anticipate what you and the students will do while moving through the lesson.

[1] David J. Pucel, "Teacher Oriented Lesson Plan" (unpublished paper – presented at workshop on Performance-Based Vocational Education , Clemson University), Summer, 1977.

SAMPLE TEACHER-ORIENTED LESSON PLAN[2]

Objective: Disconnect spark plug leads and remove all spark plugs such that the spark plugs are undamaged.

Criterion-Referenced Measure: Your instructor will provide you with a simulator from which a spark plug is to be removed. You will disconnect the lead and remove the spark plug with no damage to the spark plug.

Tools & Materials: rag, spark plug socket, socket drive, engine head with spark plugs

Other Resources: information sheet on procedure, assignment sheet, short quiz

Instructor Actions	Resources
1. Present lecture on spark plug parts. a. types of plugs b. parts and their functions Sample Questions: What does the insulator do? What is the gap?	1. Overhead transparency 2. Information Sheet 133–2 3. Assignment Sheet 133–4, rag, spark plug socket, socket drive, engine head with spark plugs. 4. Quiz 5. Assignment sheet, all necessary tools, engine heads with plugs
2. Quickly review the procedure on Information Sheet 133–2. Sample Questions: Why is it important to use a tight-fitting socket?	
3. Present the demonstration using Information Sheet 133–2 as a guide.	
4. Have students complete the quiz.	
5. Discuss each item on the quiz with the students.	
6. Give students the assignment.	
7. As students feel they are ready to demonstrate their skill, be ready to check out their performance.	

[2] Ibid.

Information Sheet 133–2[3]

PROCEDURE FOR DISCONNECTING SPARK PLUG LEADS AND REMOVING SPARK PLUGS

1. Obtain a rag, spark plug socket (size of the plug) and socket drive.
2. Wipe spark plug leads and spark plugs to remove dirt and oil.
3. Grasp the lead by the terminal insulator and clip which are covering the spark plug.
4. Twist the lead and pull the lead off.
5. Blow out dirt from around spark plug base.
6. Select a spark plug socket which fits snugly on the spark plug shell.
7. Place the spark plug socket over the spark plug so the entire shell is covered.
8. Turn the socket counterclockwise until the spark plug is removed.
9. Check to make sure old gasket is removed if a gasket-type plug is used.

Assignment Sheet 133–4

REMOVE SPARK PLUG LEADS AND SPARK PLUGS

Materials

1. rag

Tools

1. spark plug socket
2. socket drive

1. Ask instructor to assign you an engine.
2. Change the spark plugs according to the procedure on Information Sheet 133–2.
3. Sign this assignment sheet and indicate the date the assignment was completed.

Signature _____ Date _____

[3] Ibid.

SECTION III

SELECTING MEDIA, FACILITIES AND EQUIPMENT FOR PERFORMANCE–BASED VOCATIONAL EDUCATION

Media Selection

The types of media used for delivering PBVE will differ little from that used for non-performanced-based instruction. That is, the full range of media types (printed materials, audio visuals, etc.) can be used effectively for either type of instruction. The major criteria for selecting the media to be used for delivery of PBVE would be its potential for effectiveness in communicating the content related to the performance objectives.

The packaging or organization of media may differ in that the basic unit of organization in PBVE is the task. Ideally, most content presentations, regardless of the media used, would be organized around the task. Since this is frequently not true of existing publications or audio visuals, it may be necessary for students to skip about or use only certain parts or sections of books or audio visuals to find the content related to a particular performance objective. Tapes would be used for two reasons:

1. They may substitute for teachers' lectures or for written directions for students who cannot read or do not learn well through reading;

2. Taped lessons provide more freedom for students to view other media while receiving instructions via tape.

As mentioned earlier, if particular tasks are to be self-paced, then packaged materials will be needed, so that the learning is indeed self-instructional.

Facilities for Performance-Based Vocational Education

Facilities for Performance-Based Vocational Education and non-Performance-Based Vocational Education courses may be very similar. However, the increased emphasis on the task and performance of tasks will result in a more activity-oriented (hands-on) type curriculum. A more activity-oriented curriculum may call for an expansion of laboratory facilities.

Increasing the degree of individualization will, however, result in the need for such facilities as learning carrels, learning stations, and kits. Special facilities may also be required for storing modules and audio visual materials and equipment. Libraries need to be conveniently located, since students will be more responsible for selecting and obtaining their own materials.

Equipment Selection

Again, the selection of equipment may not be very different for teaching PBVE vs non-PBVE. However, if an increased degree of individualization is to be accomplished, equipment may reflect this change. Projectors, for example, would be of the type designed for individual viewing rather than group viewing.

SECTION IV

SELECTING INSTRUCTIONAL CONTENT

A very critical step in any instructional program is determining what instructional content is needed. V-TECS catalogs provide the teachers with tasks which are a type of entity. They therefore form a logical framework for an activity oriented curriculum. They are, however, only a "skeleton" – the "meat" of the program is the instructional content.

If the task is taken as the basic building block of the curriculum, then instructional content must relate to or be centered around each task. Each task can be analyzed using several perspectives to determine the type of instructional content related to each task. The V-TECS catalogs provide only one perspective – the performance guides – which are the major steps in performing the task.

This is a good start, but a more in-depth analysis is often needed to identify instructional content.

The following approach may be helpful:

1. Analyze the task to determine:

   a. the psychomotor skills required

   b. the cognitive skills required

   c. the affective or attitudinal skills required

   See the example given in CHART I.

2. Further analyze each task to determine the cognitive skills (basic science, math and communication) needed for both decision making and performance of the task.

   See CHART II p.18, provided by the Instructional Materials Laboratory at Ohio State University. Note that similar task analysis are available for approximately 60 occupations.

CHART I

TASK: Arrange a Centerpiece

	Performance Skills	Cognitive Skills	Attitudinal Skills
1.	Cut flowers and foliage to length	Select flowers	Demonstrate neatness
2.	Place holding device in container	Select container Select holding device	
3.	Place flowers	Design arrangement	Demonstrate Tender-Loving Care (TLC)
4.	Water centerpiece	Determine amount of water	

(TASK STATEMENT) ARRANGE A CENTER PIECE[4] CHART II

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON

Knife
Floral sheers
Wires
Tape
Floral paints
Foil
Candles
Center piece bowl
Foam
Chicken wire
Line
Mass
Filler
Form
Decorative material

PERFORMANCE KNOWLEDGE

Gather items used to design center piece
Principles and elements of design

Proceed to design including principles and elements of design being sensitive to holidays and special occasions, weddings and other gala affairs, religion, social group, organization

Calculate and complete billing invoice

Tag for wrapping

SAFETY – HAZARD

"K" and "L" (See Appendix)

DECISIONS	CUES	ERRORS
Choose a basic design Select a container Select flower and foliages Decide on size and quality according to price range desired	Application of design principles Consideration of customer instruction Availability of each item	Poor design Not pleasing to customer Not worth the price in size and/or quality

SCIENCE

Principles: design, balance, scale, harmony. focal point, accent, rhythm, repetition, and unity
Element: line, form, pattern, color, odor, and space
Psychological factors: holidays and special occasions, weddings, and gala affairs, religion, social group and organization, hobbies

21

MATH – NUMBER SYSTEMS

Basic arithmetic skills in relation to:
– arriving at retail price
– price of bunch or box
Measures of length [Inches in height, length – feet to follow specifications]
Measures of time and speed (Example: time – seconds, minutes, etc.; speed – feet per minute, R.P.M., etc.)
[Time alloted for arrangement]
Measures of weight [Cut foliages – fertilizer]
Measures of temperature [Regulating refrigerator and working conditions]
Liquid and dry measures [Fertilizer and bloom additives]
Ratio and proportion [Water to container – design to container]
Read and interpret charts, tables, and/or graphs [Table to determine unit or multiple price]
Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Sample pictures for wire orders - coded]

COMMUNICATIONS

Reading comprehension with sensitivity to customer's needs
Talk with salesperson about original order

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3. Determine which of these skills must be taught before the student can accomplish the task. The student may already possess all or most of the basic skills required from science, math and communicatio.. Others may need to be taught.

4. Determine whether or not the basic skills required for performing the task are common to several similar tasks. If so, such tasks might be best taught as a separate unit or module.

   Using Chart II as our example, we see that the basic principles of design are required scientific principles and should be taught before the student attempts to construct a centerpiece. But the basic principles of design are also common to the construction of several tasks performed by florist – hospital vases, bud vases, or even decorating a wedding scene. Actually the basic principles of design are relevant to most artistic designs ranging from the design of paintings to the design of buildings or automobiles.

   For this reason, the basic principles of design might best be taught in a separate module to prevent needless repetition.

5. Determine whether or not the skill to be taught is so comprehensive in scope as to require a separate subordinate (supplemental) objective–not a separate module.

   Again using CHART II as our example, we may find that selecting a container is a rather comprehensive subject and yet peculiar to the construction of the center piece. We may therefore conclude that a subordinate objective is needed, but not as a separate unit or module.

In summary, the performance objectives and performance guides provided by the V-TECS catalogs serve only as a beginning point for ferreting out the subject matter and subordinate skills to be taught. A comprehensive task analysis is needed to provide this vital information for curriculum planning.

CHECK-OUT ACTIVITIES

Inform your instructor that you are ready to be tested. You will be provided with a copy of a multiple choice test and an answer sheet. Record your answers on the answer sheet and return both the test and the answer sheet to the instructor.